

REMARKS

By the present Amendment, claim 1 has been amended to more appropriately define the present invention. Claims 1-23 are pending, with claims 19 and 21 being withdrawn from consideration as directed towards a non-elected invention.

In reply to the Office Action dated July 28, 2003, Applicants respectfully request reconsideration of the above-identified application based on the following remarks:

In the Office Action, the Examiner rejected claims 1-4, 7-14, 16, 18, 20, 22, and 23 under 35 U.S.C. § 102(e) as being anticipated by You et al. (U.S. Patent No. 6,407,009); and rejected claims 5, 6, 15, and 17 under 35 U.S.C. § 103(a) as being unpatentable over You et al. further in view of Akram et al. (U.S. Patent No. 5,925,410).

Rejection under 35 U.S.C. § 102(e)

Applicants respectfully traverse the rejection of claims 1-4, 7-14, 16, 18, 20, 22, and 23 under 35 U.S.C. § 102(e) as being anticipated by You et al.

Applicants point out that in order to properly establish that You et al. anticipates Applicants' claimed invention under 35 U.S.C. § 102(e), each and every element of the claim in issue must be found, either expressly described or under principles of inherency, in that single reference. Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." See M.P.E.P. §2131, 8th Ed., Aug. 2001, p. 2100-69, quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). Finally, "[t]he elements must be arranged as required by the claim." M.P.E.P. §2131, p. 2100-69. You et al. does not teach each and every element of Applicants' present invention as claimed.

Applicants' claim 1 recites a method of forming a solution film on an in-process substrate including, among other things, "relatively moving [a] in-process substrate or

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

[a] dropping section, wherein ... a rotational frequency w for said substrate is decreased so that the liquid dropped from said dropping section on said in-process substrate stays at a dropped position in accordance with relative movement of said dropping section from the inner periphery of said in-process substrate toward the outer periphery; and a feed rate v for said liquid from said dropping section is increased in accordance with relative movement of said dropping section from the inner periphery of said in-process substrate towards the outer periphery.”

In contrast, You et al. discloses a method for dispensing precursor solutions over the surface wherein the precursor solution is pumped through a nozzle positioned over the wafer which is rotated at the same time as the nozzle is moved between the edge of the wafer and the wafer center, thereby providing a continuous layer of precursor solution on the wafer prior to the rapid spin step. Id. at col. 3, lines 20-27. You et al. further discloses that in situations where the solution is dispensed beginning at the center of the wafer, the flow rate of solution can be progressively increased as the nozzle is moved towards the wafer edge. Id. at col. 12, lines 2-6.

In the “Response to Arguments” section of the outstanding Office Action, the Examiner alleges that “You et al. disclose rotating the wafer at a low rate of speed, the rate of speed will depend on the viscosity of the solution and if it is thinned more easily. You et al. further disclose increasing the flow rate of the solution (Col. 12, lines 2-5) and the flow rate of solution onto the wafer can vary depending on the surface tension of the liquid and the wetting behavior of the solution on the wafer surface (Col. 11, lines 25-35).” Office Action at page 6.

Applicants respectfully disagree with the Examiner's allegations and conclusions because, as previously explained in the arguments presented in the Amendment filed on May 5, 2003, You et al. merely disclose a need to have higher flow rates of solution applied to the portions of the wafer near the edges thereof in order to achieve an even thickness of solution on a wafer. More specifically, You et al. merely disclose increasing the flow rate of solution as the nozzle is moved towards the wafer edge (to compensate for the increase in linear velocity as the wafer rotates at constant angular frequency). However, You et al. does not disclose at least that the "a rotational frequency w for [a] substrate is decreased so that [a] liquid dropped from [a] dropping section on said in-process substrate stays at a dropped position in accordance with relative movement of said dropping section from the inner periphery of said in-process substrate toward the outer periphery; and a feed rate v for said liquid from said dropping section is increased in accordance with relative movement of said dropping section from the inner periphery of said in-process substrate towards the outer periphery," as recited in claim 1.

Moreover, in You et al., as the nozzle moves from the center to the wafer edge, the linear velocity increases and this increase is compensated for by increasing the flow rate. However, the increase in *linear velocity* is a result of the increase in radial distance from the center of the wafer which is rotating at a *constant angular frequency*. You et al. does not disclose at least decreasing the rotation frequency.

Because You et al. fails to disclose each and every element of independent claim 1 of the Applicants' present invention, Applicants respectfully submit that the rejection of claim 1 under 35 U.S.C. § 102(e) is improper. Applicants request the Examiner

withdraw the rejection and allow claim 1. Claims 2-4, 7-14, 16, 18, 20, 22, and 23 are also allowable at least in view of their dependency from allowable claim 1.

Rejection under 35 U.S.C. § 103(a)

The rejection of claims 5, 6, 15, and 17 is respectfully traversed, since a *prima facie* case of obviousness has not been made by the Examiner. Claims 5, 6, 15, and 17 depend from independent claim 1.

To establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), each of three requirements must be met. First, the reference or references, taken alone or combined, must teach or suggest each and every element recited in the claims. (See M.P.E.P. § 2143.03 (8th Ed. 2001).) Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, each of these requirements must "be found in the prior art, and not be based on applicant's disclosure." M.P.E.P. § 2143 (8th Ed. 2001).

As discussed above regarding the rejection of claim 1 under 35 U.S.C. § 102(e), You et al. fails to teach or suggest at least "relatively moving [a] in-process substrate or [a] dropping section, wherein ... a rotational frequency w for said substrate is decreased so that the liquid dropped from said dropping section on said in-process substrate stays at a dropped position in accordance with relative movement of said dropping section from the inner periphery of said in-process substrate toward the outer periphery; and a feed rate v for said liquid from said dropping section is increased in accordance with

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

relative movement of said dropping section from the inner periphery of said in-process substrate towards the outer periphery,” as recited in claim 1.

Cited merely for teaching applying vibrations to a solution, Akram et al. fails to cure the deficiencies of You et al. noted above.

Therefore, You et al. and Akram et al., either taken alone or in combination, do not teach or suggest at least “relatively moving [a] in-process substrate or [a] dropping section, wherein ... a rotational frequency w for said substrate is decreased so that the liquid dropped from said dropping section on said in-process substrate stays at a dropped position in accordance with relative movement of said dropping section from the inner periphery of said in-process substrate toward the outer periphery; and a feed rate v for said liquid from said dropping section is increased in accordance with relative movement of said dropping section from the inner periphery of said in-process substrate towards the outer periphery,” as recited in claim 1.

Accordingly, You et al. and Akram et al., either taken alone or in combination do not teach or suggest each and every element of claims 5, 6, 15, and 17, which depend from independent claim 1.

The Examiner further states in the “Response to Arguments” section of the Office Action that “[i]n response to applicant’s arguments against the references individually, one cannot show nonobviousness by attacking the references individually where the rejections are based on combination of references.” Office Action at page 6. However, the Examiner has mischaracterized the arguments presented in the previous response; namely, that You et al. and Akram et al., either taken alone or *in combination*, do not teach or suggest each and every element of the rejected claims.

Further, Applicants respectfully disagree with the Examiner's allegations that it would have been within the scope of one of ordinary skill in the art to combine the teachings of You et al. and Akram et al. to enable formation of the solid layer. You et al. discloses dispensing of *solutions* containing thin film precursor and does not provide any motivation for formation of solid layer and further applying vibrations. Likewise, there is lack of any reasonable expectation of success from doing so. Therefore, a combination of You et al. and Akram et al. under 35 U.S.C. § 103(a) is improper.

To summarize, the Examiner has failed to make a *prima facie* case of obviousness at least because You et al. and Akram et al., either taken alone or in combination, do not teach each and every element of claims 5, 6, 15, and 17, which depend from allowable claim 1. Therefore, Applicants respectfully request that the Examiner withdraw the rejection of claims 5, 6, 15, and 17 under 35 U.S.C. § 103(a), and the claims be allowed.

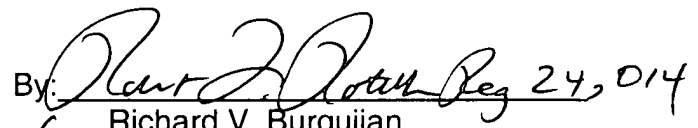
In view of the foregoing remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: October 28, 2003

By: 
for Richard V. Burgujian
Reg. No. 31,744